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(54) A method and system for off-line loading of stored value cards using a batch-load terminal

(57) A method and system for batch loading a stored value application of a microprocessor based stored value card includes a stored value card reader/writer connected to a local computer device and a batch-load application running on the same computer device which securely stores load key information and emulates the remote functions of an on-line load transaction. The computer also has a security module for storing load key information and an encryption device. Communication is initiated on the card reader at the local computer device between the stored value application and the batch-load application, and an off-line batch-load transaction is performed in which the load key information is validated and a funding source is also validated. An authorizing message is sent by the batch-load application to the stored value application with data representing a pre-selected monetary value. The batch-load application collects load transaction data and generates a load transaction file to a system provider and a funding source.

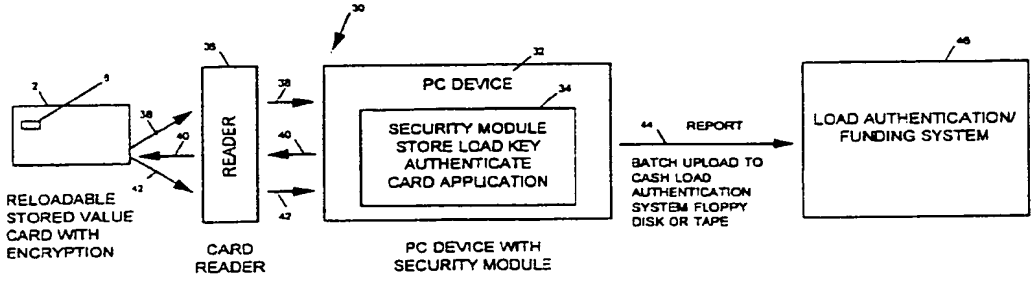

FIG. 3

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essor is put into a decryption device at a local batch-load terminal. In this way, the load process can be carried out securely at the local batch-load terminal.

[0011] In an embodiment of the present invention, a microprocessor based card is initialized with a load key with or without storing value on the card. Cards which are initialized without value are loaded with value on the batch-load terminal. Load information for the batch-load terminal transaction is logged in a transaction log. When the cards are sold, funding information is provided to a funding system of the financial institution. The load key is either a standard load key which allows successive reloading or a special load key which prevents reloading of the card after the original value is used. Thus, the card with the special load key is a disposable microprocessor based stored value card.

[0012] In an embodiment of the present invention, effectively, the disposable microprocessor card has a starting value on it. Once the value is used up, it cannot be reloaded by normal means. Therefore, the disposable microprocessor card has all the security advantages of a reloadable card and none of the disadvantages of a disposable memory based card. The microprocessor based card with the special load key is thus a disposable card which can be used by collectors in the same way disposable memory based stored value cards are currently used, or for any other purpose for which disposable memory cards are presently used.

[0013] To achieve the stated and other features, advantages and objects, an embodiment of the present invention provides a method and system for batch loading the stored value application of a stored value card microprocessor. Communication is initiated on a stored value card reader at a local terminal between the stored value application and a batch-load application residing on the local terminal. A request for a load transaction is transmitted for the stored value application to the batch load application, and the batch-load application authorizes the load transaction in response to the request. The stored value application and the batch-load terminal include secret load key information for the load transaction.

[0014] In an embodiment of the present invention, the load key information is stored securely in a security module on the local terminal. The local terminal is a computer, for example a personal computer, at a financial institution, such as a bank. The batch-load application also includes an encryption device and a CD-ROM for security purposes. The request for the load transaction includes a request from the stored value application to the batch-load application to load a preselected monetary value to the stored value application. The request is transmitted from the stored value application to the batch-load application as an encrypted message and includes the load key information. The batch-load application decrypts the encrypted message and validates the load key information. The batch load application also confirms a funding source, such as the financial institution, and transmits an authorizing message to the stored value application, including data representing the pre-selected monetary value. The authorizing message also includes, for example, load key information and card serial number information.

[0015] In an embodiment of the present invention, before batch-loading the stored value card, the stored value application is initialized by unlocking the application with transport key information. The transport key information is exchanged for the load key information, which may be a reloadable load key that allows successive reloading or a non-reloadable load key which cannot be reloaded after the original loading of stored value. After the load transaction is authorized, the transaction is confirmed by the stored value application transmitting a load completion message to the batch-load application. The batch load application collects data about the load transaction from the messages communicated between the stored value application and the batch-load application and logs the data in a load transaction log. The batch-load application also generates the load transaction log to a stored value card load transaction file and transmits the file to the card system provider and the funding source, such as the financial institution.

[0016] In an embodiment of the present invention, the system components include a stored value card reader/writer, which can read and write to the stored value application and which is connected to the financial institution's personal computer. The batch-load application runs on the same personal computer, which is also has a security module for storing the load key information, as well as an encryption device. The batch-load application includes a methodology for collecting the messages transmitted between the stored value application and the batch load application as load transaction data and for generating log files of the load transaction data to the system provider and the funding source. A card feeder mechanism is provided to load cards automatically to the card reader/writer from a feed hopper. A collection hopper is provided to collect the cards after loading, and a reject hopper is provided to collect rejected cards.

[0017] Additional objects, advantages and novel features of the invention will be set forth in part in the description which follows, and in part will become more apparent to those skilled in the art upon examination of the following, or may be learned by practice of the invention.

Brief Description of the Drawings

[0018]

Fig. 1 shows a stored value card embedded with a microprocessor chip for an embodiment of the present invention;

Fig. 2 is a flow chart which illustrates the compo-

of the key components for an embodiment of the present invention and illustrates the flow of information between the components. Referring to Fig. 3, the batch-load terminal, shown generally as 30, uses a computer application of a financial institution's local PC device 32 which emulates the on-line load process for an embodiment of the present invention. The PC device 32 is used in combination with a secure decryption device or module 34, for example, as an attachment or a plug board. Fig. 4 is a somewhat schematic diagram which provides further detail regarding the key components for an embodiment of the present invention. In addition to PC device 32, batch load terminal 30 also includes a card reader/writer 60 and a stored value card reader/writer 36, a monitor 62, a keyboard 64, a mouse 66 and a printer 68. Terminal 30 is located locally in a secured financial institution facility, and the application program on local PC device 32 is used to simulate the remote functions of the on-line load process. The secret load key is supplied by the system provider and stored in the security module 34 on the local PC device 32 of the financial institution. The computer application on PC device 32 includes a methodology which collects all messages between the components, including request message 38, authorization message 40, and load confirmation message 42. Load confirmation message 42 is collected as the confirmation that card 2 has been loaded. Log files of load transaction information are generated at 44 for the system provider and financial institution at 46.

[0024] In an embodiment of the present invention, for security reasons, the batch-load terminal applications, including utilities, require a CD-ROM to be installed in the local PC device 32 of batch-load terminal 30. The software is implemented not to run from any device other than the CD-ROM and requires the decrypting device 34 to be installed in PC device 32. The application resides on a CD-ROM and runs only from the CD-ROM. The CD-ROM can be removed and stored securely when batch-load terminal 30 is not in use. For example, batch load terminal 30 uses a Windows NT 4.0 Workstation configured to permit operation only when the CD-ROM is installed and two keys have been entered using passwords encrypted by encryption device 34. The processing of stored value cards is logged in a transaction log. The log is sent to a smart card file entity for adding stored value card data to a smart card file. The smart card file provides a database containing the information required to send funding and load advice messages at 44. When stored value cards are issued, for example, to merchants or customers, notice is sent to the load authorization and funding systems 46.

[0025] In an embodiment of the present invention, the software mechanism is used to load the card 2 locally using only the financial institution's local PC device 32, with the decryption or security device 34 to store the load key and the computer program to emulate the on-line load. Information is then presented to the financial system at 44 to confirm that card 2 has been activated with value. It is necessary to present the information confirming that card 2 has been activated with value, because there is a funding risk or liability against the financial institution. In other words, although card 2 is loaded, the card may not be active. Once card 2 is loaded, activation is confirmed by attaching the single card reader 60 to the financial institution PC device 32 and manually loading stored value cards, one at a time. The confirmation process is automated with readily available equipment which provides a transport mechanism that takes a single smart card 2 and moves it into a read/write location and writes information or reads information and then ejects the card.

[0026] Fig. 5 is a schematic flow chart which amplifies the flow of information shown in Fig. 3 and provides further detail regarding the components involved in the process of multiple-card batch loading for an embodiment of the present invention. Referring to Fig. 5, a mechanism 50 is provided to front end the transport. Fig. 6 is a somewhat schematic diagram which provides further detail regarding the transport mechanism or enclosure 50 shown in Fig. 5 for an embodiment of the present invention. Fig. 7 is also a somewhat schematic diagram which provides further detail regarding the components for the process of multiple-card loading illustrated in Fig. 5 for an embodiment of the present invention. Referring to Figs. 5-7, mechanism 50 includes a card feeder or hopper 52 that allows a stack of cards to be placed in mechanism 50. The PC device 32 permits the addition of the enclosure 50 with a hopper 52 as a peripheral. The PC device 32 has a motorized smartcard reader/writer transport 54 equipped with hoppers 56, 58 to process a pre-determined number of cards per hour. The batch-load terminal 30 with hopper 52 can process a number of stored value cards at a time, although stored value cards can still be processed one at a time for small sessions. For example, a stack of cards are placed in the feeder 50. The same PC system 32 with motorized transport 54 is used, but an automated dial-up terminal emulation application is used to load the cards at a pre-determined rate.

[0027] In an embodiment of the present invention, alternatively, a mechanism to front end the transport has a cassette which is loaded with a number of cards and inserted into mechanism 50. Mechanism 50 has a feed hopper 52 and a transport 54 for reading and writing. Mechanism 50 also has a device for rejecting cards into a separate hopper 56. Further, mechanism 50 has an exit collection device 58 for the loaded cards. The PC device 32 which performs the load functions also controls the hopper 52 to feed cards to the read/write smart card station 54 and the exit hopper 58 to collect the loaded cards, and a reject path 56 is provided. The financial institution module 34 is used to store the load key. A load program operates the identified mechanical card transport components and generates the neces-

ples of the present invention. Numerous modifications and adaptations thereof will be readily apparent to those skilled in the art without departing from the spirit and scope of the present invention. Accordingly, the invention is only limited by the following claims.

Claims

1. A method of batch loading value tp a stored value card, comprising:

   initiating communication at a local terminal between the stored value application and a batch-load application residing on the local terminal;
   automatically transmitting a request for a load transaction for the stored value application; and
   automatically authorizing the load transaction by the batch-load application.

2. The method of claim 1, wherein initiating further comprises initiating communication on a card reader device of the local terminal

3. The method of claim 2 further comprising automatically feeding a stored value card embedded with the stored value application to the card reader device.

4. The method of claim 1, wherein the stored value application comprises an application residing on a stored value card microprocessor

5. The method of claim 1, wherein the local terminal comprises a computer.

6. The method of claim 5, wherein the computer comprises a financial institution computer.

7. The method of claim 6 wherein the financial institution computer comprises a bank personal computer.

8. The method of claim 1, wherein the batch-load application comprises a security module.

9. The method of claim 8, wherein the security module comprises load key information.

10. The method of claim 1, wherein the batch-load application comprises an encryption device.

11. The method of claim 1, wherein the batch-load application comprises a CD-ROM.

12. The method of claim 1, wherein transmitting further comprises transmitting the request to the batch-load application.

13. The method of claim 1, wherein transmitting further comprises pre-selecting a monetary value for the load transaction.

14. The method of claim 13, wherein transmitting further comprises transmitting a request for a load of the pre-selected monetary value.

15. The method of claim 1, wherein the request comprises an encrypted message.

16. The method of claim 15, wherein the encrypted message comprises load key information.

17. The method of claim 16, wherein authorizing further comprises decrypting the encrypted message.

18. The method of claim 17, wherein authorizing further comprises validating the load key information.

19. The method of claim 1, wherein authorizing further comprises confirming a funding source.

20. The method of claim 19, wherein the funding source comprises a financial institution.

21. The method of claim 1, wherein authorizing further comprises transmitting an authorizing message to the stored value application.

22. The method of claim 21, wherein the authorizing message comprises data representing a pre-selected monetary value.

23. The method of claim 22, wherein the authorizing message further comprises data representing stored value card purchase code information.

24. The method of claim 22, wherein the authorizing message further comprises data representing stored value card serial number information.

25. The method of claim 1, further comprising initializing the stored value application.

26. The method of claim 25, wherein initializing further comprises unlocking the stored value application with transport key information.

27. The method of claim 26, wherein unlocking further comprises exchanging the transport key information for load key information.

28. The method of claim 27, wherein the load key information comprises a reloadable load key.

29. The method of claim 27, wherein the load key information comprises a non-reloadable load key.

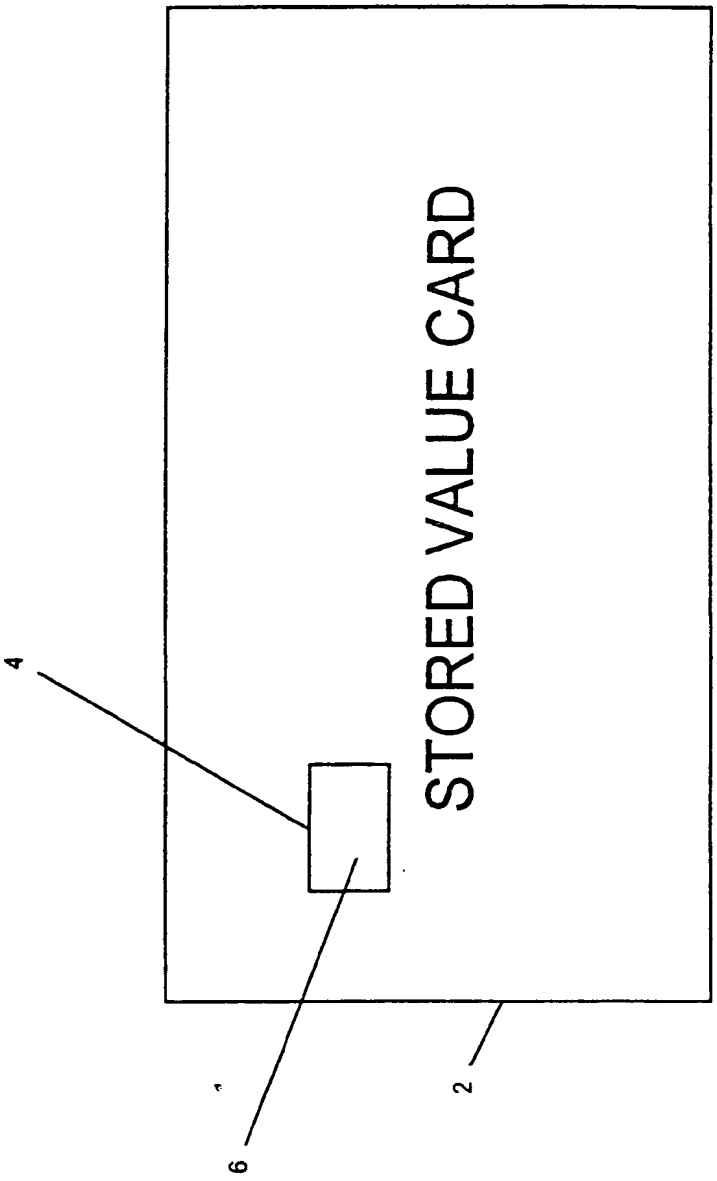

FIG. 1

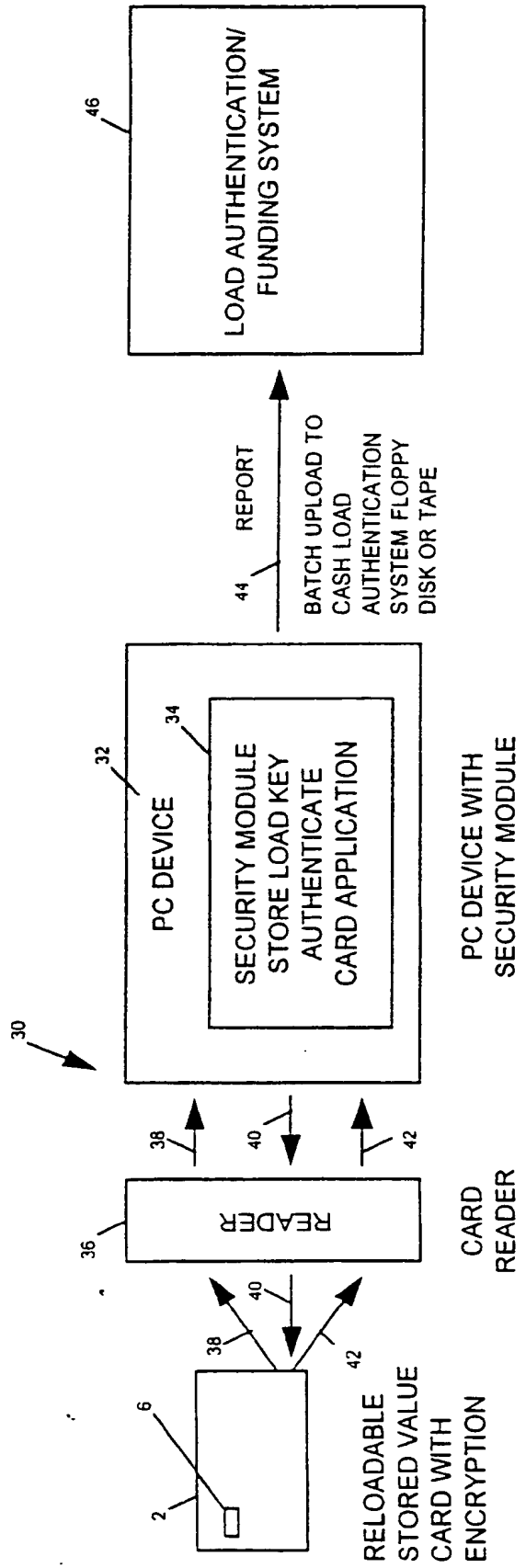
LOAD AUTHENTICATION/
FUNDING SYSTEM
46
REPORT
44
BATCH UPLOAD TO
CASH LOAD
AUTHENTICATION
SYSTEM FLOPPY
DISK OR TAPE
PC DEVICE
32
SECURITY MODULE
STORE LOAD KEY
AUTHENTICATE
CARD APPLICATION
34
PC DEVICE WITH
SECURITY MODULE
30
38
40
42
READER
36
CARD
READER
RELOADABLE
STORED VALUE
CARD WITH
ENCRYPTION
2
6

FIG. 3

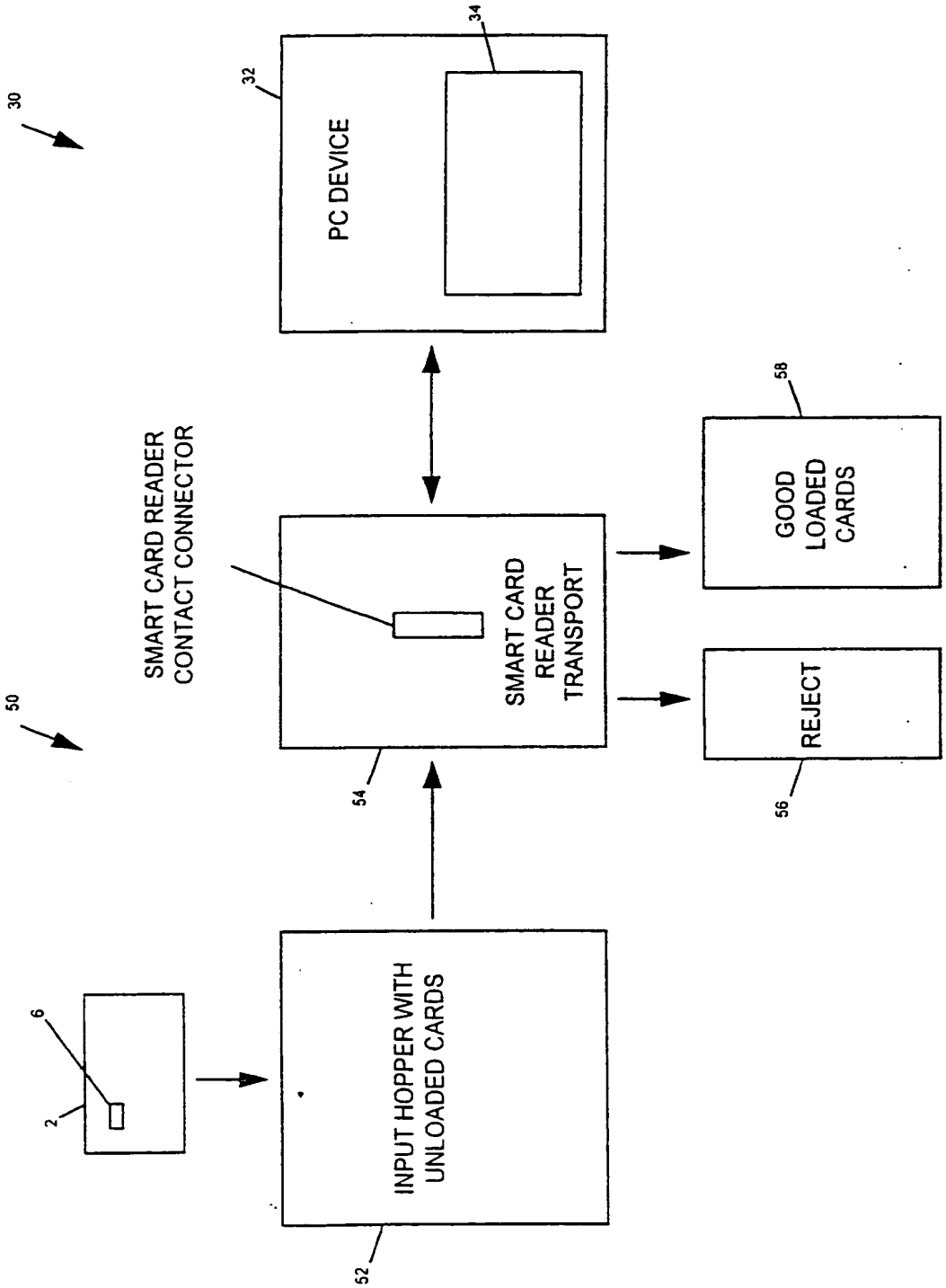
30
32
34
PC DEVICE
SMART CARD READER CONTACT CONNECTOR
50
SMART CARD READER TRANSPORT
54
58
GOOD LOADED CARDS
56
REJECT
6
2
INPUT HOPPER WITH UNLOADED CARDS
52

FIG. 5

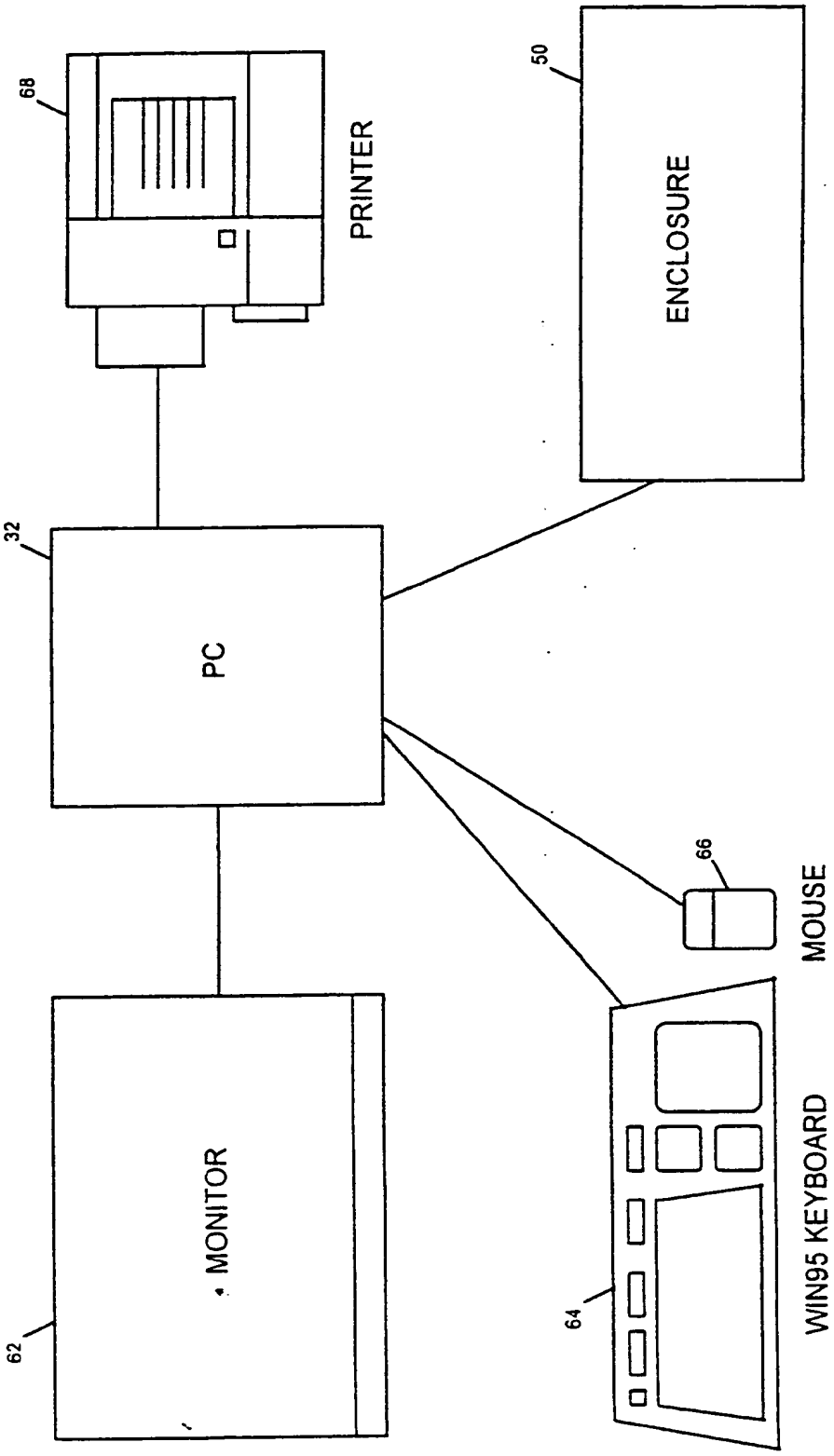
68
PRINTER
50
ENCLOSURE
32
PC
66
MOUSE
62
MONITOR
64
WIN95 KEYBOARD

FIG. 7

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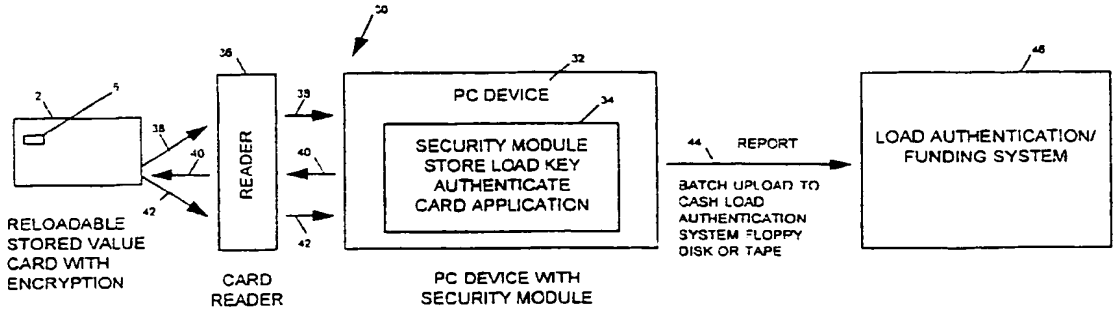

FIG. 3

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26-02-2002

Patent document cited in search report		Publication date		Patent family member(s)	Publication date
WO 9609592	A	28-03-1996	IL	115164 A	12-03-1999
			AU	704604 B2	29-04-1999
			AU	3723795 A	09-04-1996
			BR	9509085 A	30-12-1997
			CA	2200847 A1	28-03-1996
			EP	0782732 A1	09-07-1997
			HU	77026 A2	02-03-1998
			JP	10508710 T	25-08-1998
			RU	2145436 C1	10-02-2000
			WO	9609592 A1	28-03-1996
			US	5728999 A	17-03-1998
			US	5744787 A	28-04-1998
WO 9818107	A	30-04-1998	EP	0944879 A1	29-09-1999
			WO	9818107 A1	30-04-1998
EP 0700024	A	06-03-1996	US	5500517 A	19-03-1996
			AT	199191 T	15-02-2001
			DE	69520083 D1	22-03-2001
			DE	69520083 T2	06-09-2001
			EP	0700024 A1	06-03-1996
			JP	8227445 A	03-09-1996
US 5440634	A	08-08-1995	AT	145744 T	15-12-1996
			AU	663739 B2	19-10-1995
			AU	2888692 A	21-05-1993
			BR	9205416 A	17-05-1994
			CA	2098481 A1	17-04-1993
			DE	69215501 D1	09-01-1997
			DE	69215501 T2	27-03-1997
			DK	567610 T3	17-02-1997
			EP	0567610 A1	03-11-1993
			ES	2096772 T3	16-03-1997
			WO	9308545 A1	29-04-1993
			GR	3022528 T3	31-05-1997
			HK	1001573 A1	26-06-1998
			JP	2853331 B2	03-02-1999
			JP	6503913 T	28-04-1994
			KR	161670 B1	20-03-1999
			MD	1402 F2	31-01-2000
			NO	303893 B1	14-09-1998
			PL	299825 A1	18-04-1994
			RU	2137187 C1	10-09-1999
US 4992646	A	12-02-1991	FR	2632101 A1	01-12-1989
			FR	2639742 A2	01-06-1990

EPO FORM P0459

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